Remarks

The present amendment responds to the final Official Action dated March 21, 2005. The Official Action rejected claims 2-21 under 35 U.S.C. § 102 as being anticipated by Matt et al. U.S. Patent No. 5,909,489 (Matt). These grounds of rejection are addressed below.

New claim 22 has been added by amendment. This claim is based on claim 21 with the added language shown underlined in Appendix A hereto. Claims 2-22 are presently pending.

The Art Rejections

The Official Action rejected claims 2-21 under 35 U.S.C. 102 as being anticipated by Matt. It is clear the rejection based upon Matt is not supported by a careful reading of that reference and the rejections based thereupon should be reconsidered and withdrawn. Further, the Applicant does not acquiesce in the analysis of Matt made by the Official Action and respectfully traverses the Official Action's analysis underlying its rejections.

Matt discloses a line echo suppressor circuit for a speech communication system. The near-end of Matt's communication system used by a local subscriber A includes a microphone 1.2 which, through an analog to digital converter 1.4, generates transmit path 1.3 signal x(k). The near-end of Matt's communication system further includes a speaker 1.1 which is driven by a receive path 1.5 signal y(k) through an analog to digital converter 1.6. Matt, col. 4, lines 43-53, col. 5, lines 13-16, and Fig. 2a (emphasis added). Matt states one of the steps of "improving transmission properties of an echo affected signal on a transmission link" is "providing, in response to said sensing of the receive path, a noise signal having a magnitude indicative of a

noise level on said receive path ...". Matt, col. 2, lines 65-67 and col. 3, lines 5-7 (emphasis added). The "noise level on said receive path" is a noise level "ynlam" "which is a measure of the noise level in receive path 1.5" y(k) which is received from the far end of the system. Matt, col. 6, lines 25-28.

It appears that the closest Matt comes to having a near-end noise level estimator is with the signal "xlam" provided by circuit 3.4. However, the signal "xlam" is simply used in comparator 3.10 to determine when near end subscriber A is speaking in order to enable the coupling estimator 3.6. Matt, col. 6, lines 20-23. The signal "xlam" is not used anywhere else in the line echo suppressor 3. Matt's maximum value decision circuit 3.8 uses a **far-end noise level estimate "ynlam"** as an input for controlling its operation. However, Matt does not have a near-end noise level estimate of transmit path 1.3 of signal x(k) as an input to the maximum value decision circuit 3.8.

Matt's compander 3.7 shifts a characteristic transfer function based on a signal "us" generated by maximum value decision circuit 3.8. "The maximum value decision circuit 3.8 determines whether the coupling at the near end of the line" represented by signal "thrs", "the noise level", a far-end noise level estimate represented by signal "ynlam", "or the speech level", represented by signal "yslam", "of the receive path is dominant for determining the position of the compander characteristic." Matt, col. 7, lines 18-21. (emphasis added) The compander 3.7's characteristic transfer function is a relationship between the "output value youtsam" and the "input value ysam". Matt, col. 5, lines 28-31 and Fig. 3a. Matt does not discuss a compression

range of the compander 3.7 characteristic transfer function that is adaptively adjustable as presently claimed.

The maximum decision circuit 3.8 does not control the shape of the compander characteristic curve, but rather controls the position of the compander characteristic curve. "The position depends on the magnitude of the output signal us from the maximum value decision circuit 3.8. The compander characteristic can be shifted along a range which is defined by the magnitudes of the output signal us." Matt, col. 7, lines 18-25 (emphasis added). This shifting of the compander characteristic curve is shown in more detail in Fig. 3a which highlights that the "range" Matt describes concerns the operating point for a single compander characteristic curve. The same curve is shown at a "usmin" position, a "usmax" position, and an inbetween "uso" position with a "range" us. The "range" us is not the same as a far end signal compression range as described and presently claimed.

Highlighted on Matt's compander characteristic curve are three points P1, P2, and P3. The portion of the curve between P1 and P2 is the expander area of the curve. The portion of the curve between P2 and P3 is considered a transition area which "adjoins the adjacent compression and expansion areas". "The operating point, ... is usually located in the transition area. In the compression area, the output values youtsam are constant with variable input values ysam." Matt, col. 5, lines 42-53. Matt's compression area, labeled as the flat area at 0dB in Matt Fig. 3a, appears to correspond to the limiter area 50 of the present invention. See Fig. 2 of the present specification. Matt does not identify a linear amplification area 30 or a compressor area 40 as

illustrated in Fig. 2 of the present specification. Claim 21 of the present application is directed to aspects of advantageous utilization of the compressor area 40 of the present invention.

Claim 21 of the present invention requires "a first noise adaptive compander", such as noise adaptive compander 3, "comprising: a first input for receiving a far-end signal", such as far end signal X 9, "a second input for receiving the near-end noise level estimate", such as Ny from noise estimator 4, "a first output for producing a near-end noise compensated output signal", such as output 8. See Fig. 1 of the present specification. Matt's compander 3.7 does not receive a near-end noise level estimate, nor does maximum value decision circuit 3.8 receive a near-end noise level estimate.

In claim 21 of the present invention, the first noise adaptive compander also comprises "a compressor gain control unit" such as compressor gain unit 300 of Fig. 3. Matt does not have a compressor gain unit since in Matt the compression area is a limit area. Matt, col. 5, lines 51-53.

Claim 21 continues:

> a compressor gain control unit, wherein the first noise adaptive compander receives the far-end signal at the first input and receives the near-end noise level estimate at the second input, the compressor gain control unit adaptively adjusts a far-end signal compression range based on the near-end noise level estimate to adaptively compress the far-end signal to compensate for noise, whereby the first noise-adaptive compander operates to adjustably amplify the far-end signal based upon the near-end noise level estimate to produce the near-end noise compensated output signal at the first output.

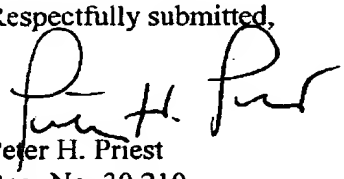
The compressor gain control unit 300 of the first noise adaptive compander, such as noise adaptive compander 3, adaptively adjusts a far-end signal compression range based on the near-end noise level estimate. See present specification paragraphs 43, 45, and 55, for example.

Since Matt's compander does not control a portion of its characteristic transfer function that is comparable to the "compressor area" of the present invention and since Matt does not provide circuitry to vary a compressor range of operation, Matt clearly does not recognize the problems addressed by the present invention. Further, nothing in Matt indicates an apparatus or method which would solve the problems of adaptive noise compensation by use of a compressor gain control unit that adaptively adjusts a far-end signal compression range based on the near-end noise level estimate as addressed by the present invention. The claims are not taught, are not inherent, and are not obvious in light of Matt.

Conclusion

All of the presently pending claims, as previously amended, appearing to define over the applied references, withdrawal of the present rejection and prompt allowance are requested.

Respectfully submitted,



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